

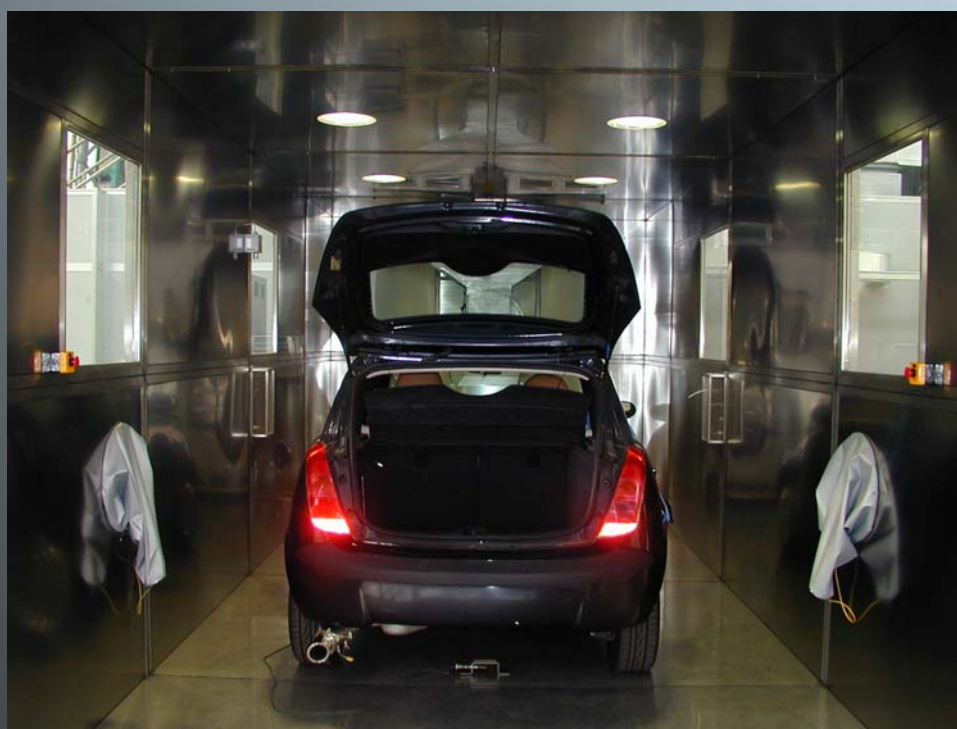


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Joint EUCAR/JRC/CONCAWE Study on: Effects of Gasoline Vapour Pressure and Ethanol Content on Evaporative Emissions from Modern Cars

Edited by G. Martini



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Abstract

A test programme designed to investigate the influence of gasoline vapour pressure and ethanol content on evaporative emissions from modern passenger cars has been carried out by the Joint Research Centre of the European Commission jointly with CONCAWE and EUCAR. Seven gasoline passenger cars representative of current EURO 3/4 emissions technology were tested for evaporative emissions with ten different test fuels. The test fuel matrix comprised 60 and 70 kPa hydrocarbon base fuels with 5 and 10% ethanol splash blends and 5 and 10% ethanol matched volatility blends. The evaporative emission tests were carried out according to a test protocol based on the European homologation test procedure, with no additional vehicle conditioning. Although this test protocol turned out to have a considerable influence on the results, the programme has provided valuable information and several clear conclusions can be drawn. The programme confirmed that vapour pressure (DVPE) is a key fuel variable for evaporative emissions. However the effect of vapour pressure is strongly non-linear; the ethanol blends with final DVPE around 75 kPa gave considerably higher evaporative emissions than the lower volatility fuels in most of the vehicles. Differences between fuels with DVPE in the range 60-70 kPa were small. Additional tests on two vehicles performed after the main programme have raised some questions about possible effects of ethanol on carbon canister working capacity and on the role of permeation in determining evaporative emissions.



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